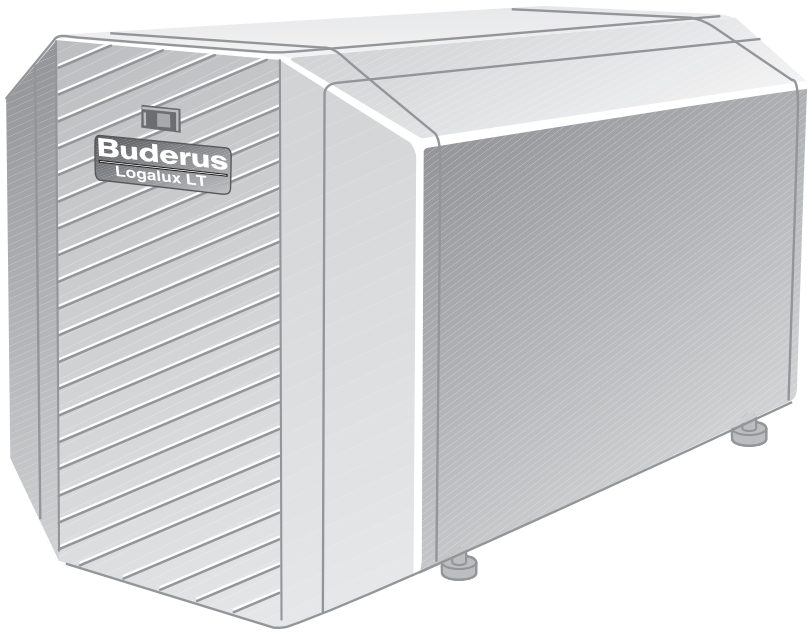
Installation and Maintenance Manual

Indirect-fired Water Heaters
Logalux LT135/2 – 300/2



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Foreword

To these instructions

This Installation and Maintenance manual contains important information regarding proper installation, operation and maintenance of the indirect fired domestic hot water tank series LT135/2 - 300/2 (DHW storage tank).

The installation and maintenance instructions are directed at a licensed installing contractor with knowledge of accepted industry practices for the installation and maintenance of the equipment and various applications of the equipment involved.

- Please inform the owner regarding proper use of the equipment and point out the safety components and features of the equipment.
- Please hand over after finalizing the installation these technical documents to the end user.

Technical Changes!

Buderus Hydronic Systems, Inc. reserves the right to make changes due to continued technological and engineering improvements.

Updating Technical Information

Please contact us if you have suggestions for improving this manual or when you have noticed incorrect information.

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1 General Information

1.1 Standards and Guidelines

Caution!

Please observe the local and state requirements regarding equipment installation!

NOTICE

When installing the tank in the state of Massachusetts the installation must by done by a Massachusetts licensed plumber or contractor.

1.2 Tools, Materials and Test Equipment

Standard tools and equipment from the HVAC industry are required for the installation.

Other useful components:

- Dolly with strap
- Transport aids: 3 pipes with ¾“ NPT or 1“ NPT (see page 9)
- Dry vac for cleaning
- Electrical test equipment to check anode operation

2 Safety Considerations

2.1 Intended use

The tank is designed for heating and storing drinking water. Please observe national, regional, and local codes, regulations, guidelines and standards for drinking water.

Install this tank only in sealed unvented hydronic heating systems.

Any other purpose is considered improper use. Any resulting damage is excluded from the manufacturer's warranty.

Requirements for drinking water	Unit	
Water hardness, min.	ppm grain/US gallon °dH	36 2.1 2
pH value, min.– max.		6.5– 9.5
Conductivity, min.– max.	µS/cm	130– 1500

Tab. 1 Requirements for drinking water

2.2 Guideline of Notices

Two levels of danger are identified by the following warning labels:

WARNING!

HEALTH DANGER

Denotes a possible severely dangerous situation where, without proper caution, bodily injury or loss of life may result.

CAUTION!

DANGER OF INJURY/SYSTEM DAMAGE

Denotes a possible dangerous situation that can lead to mild to moderate bodily injury or physical damage.

The following symbols are used to denote danger and other notices:

WARNING!

DANGER

Due to electricity.

APPLICATION NOTICE

Application comment for optimum use of equipment and adjustment as well as useful information.

2.3 Observe the following Notices

WARNING!

HEALTH DANGER

Due to improper cleaning the domestic hot water can be contaminated.

CAUTION!

TANK DAMAGE

Due to improper cleaning and maintenance.

- A bi-annual cleaning is recommended.
- Please correct any issue immediately, to avoid further damage.

APPLICATION NOTICE

Use only original Buderus parts for service and replacement. We are not responsible for damage caused by non-Buderus parts.

2.4 Waste Disposal

- Dispose of the packaging components in an environmental friendly manner.
- The old replaced DHW tank, if present, shall be disposed off properly.

3 Product Description

The LT135/2 - 300/2 indirect fired domestic hot water tanks are factory assembled with exception of screw-on feet (packaged with the boiler) and piping accessories (packaged in envelope with tank) to be installed in the field.

The major components of the tank are:

– Tank vessel with corrosion protection
Corrosion protection is provided by hygienic Buderus Thermoglaze "DUOCLEAN" as well as additional cathodic protection using a magnesium anode rod (Fig. 1, **Item. 5**), which is accessible by means of the clean-out cover (Fig. 1, **Item. 2**).

– Clean-out cover (Fig. 1, **Item. 2**) for maintenance and service access.

– Insulation (Fig. 1, **Item. 3**)
The insulation consists of high density polyurethane directly attached to the tank vessel. An insulating ring (Fig. 1, **Item. 6**) reduces heat loss from the clean-out cover.

– Domestic water temperature sensor bracket (when using Buderus Logamatic control) (Fig. 1, **Item. 4**)
The sensor is strapped under the clip on the clean-out cover for temperature control when using a Buderus Logamatic control. When using a Honeywell aquastat (not furnished), the coupling and immersion well supplied are connected to the EZ connection on the back of the tank.

– Smooth surface heat exchanger
A smooth surface heat exchanger inside the tank vessel transfers the energy from the boiler water to the domestic water. The temperature in the tank will be evenly distributed.

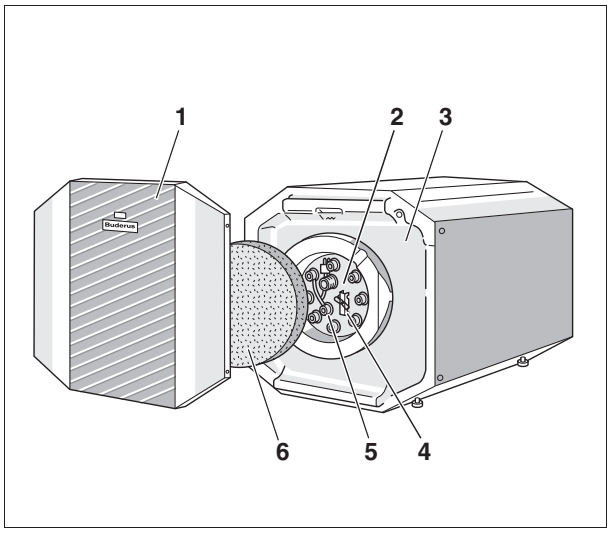

Fig. 1 Logalux LT135/2 – 300/2

Item. 1: *Front cover*

Item. 2: *Clean-out cover*

Item. 3: *Insulation*

Item. 4: *Sensor bracket*

Item. 5: *Magnesium anode rod*

Item. 6: *Insulation clean out*

4 Technical Information

4.1 Dimensions and Connections

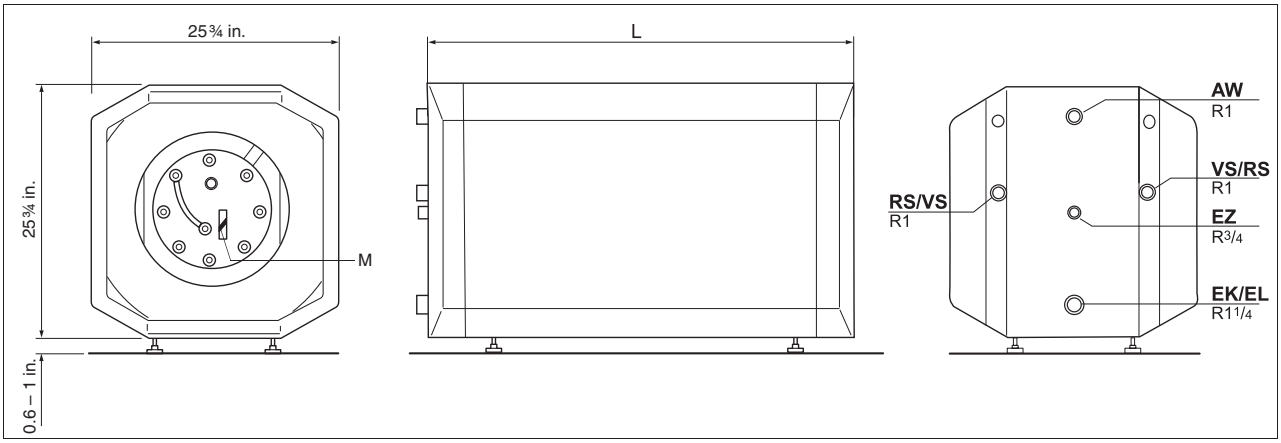

Fig. 2 Dimensions and Connections

M: Strap-on location for Logamatic/SP30D sensor

AW: DHW Outlet

VS: Boiler Water Supply

RS: Boiler Water Return

EZ: DHW recirc connection/well for Honeywell aquastat

EK: DHW Inlet

EL: Tank Drain

Type	Tank content	VS/RS/AW	EK/EL	EZ	Length L	Weight[1]
	Gal.				In.	Lbs.
LT135/2	36	NPT 1	NPT 1¼	NPT ¾	32	190
LT160/2	42				36¼	220
LT200/2	53				42¼	247
LT300/2	79				57¾	364

Table 2 Dimensions and Connections

1 without water, incl. packaging.

4.2 Safety Standards

CAUTION!

TANK DAMAGE

Due to exceeding critical values.

- Please observe the maximium listed safety values.

Maximum Value	Tempe-rature	Operating pressure	Test pressure[2]
	°C (°F)	bar (psi)	bar (psi)
Boiler water	100 (212)	16 (232)[1]	k.A.[1]
Domestic water	95 (203)	10 (145[3])	10 (145[3])

Table 3 Limiting Values for DHW Tanks

1 Depending on relief valve and expansion tank settings.

2 Operating and Test Pressures are gauge pressures.

3 Maximum 100 psi for Massachussetts.

5 Transportation and Placement

NOTICE

- The storage tank can be moved in its original packaging. This will protect the tank against possible damage.

5.1 Moving the Tank on the Pallet

Use suitable cart/dolly to move the tank. Secure the tank from tipping over.

NOTICE

The tank can also be moved using a overhead crane. Cut out a portion from the top insulation and put hook through the lifting eye at the tank top.

- Remove plastic wrapping across from the side of the tank labelled "Kessel -Speicherbefestigung" (Fig. 3).
- Remove only this cut-out section.
- Screw in the 4 tank feet (Fig. 3, **Item. 2**) (packaged with boiler in plastic bag) about ½" into the bottom of the tank.
- Remove the two wooden corner posts (Fig. 3, **Item. 1**) from the bottom side of the tank.
- Tip the tank horizontally using the pallet as support (Fig. 4).
- Remove rest of plastic wrapping, packaging material and pallet by lifting the tank carefully.

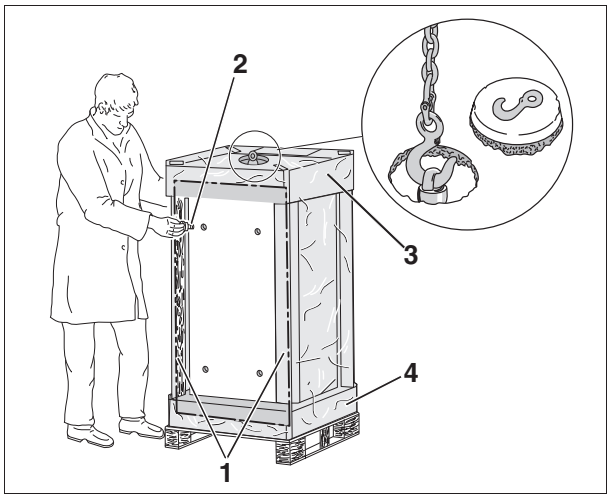

Fig. 3 Cut out of plastic wrapping and screwing in of feet

Item. 1: *Wooden corner posts*

Item. 2: *Screw-in feet*

Item. 3: *Back side of tank*

Item. 4: *Front side of tank*

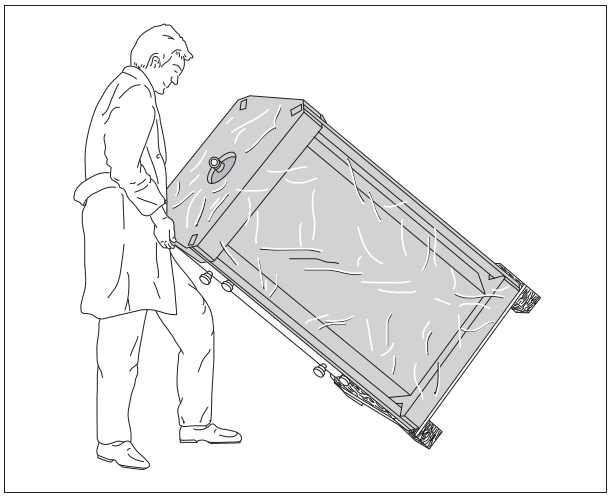

Fig. 4 Placement of tank

5.2 Moving the Tank Unpackaged

You can easily move the tank when you attach three carrying pipe stubs (not supplied) to the tank.

- Remove the 4 front panel screws (Fig. 5).
- Remove front panel. Pull the front and bottom of the panel back.
- Remove insulating ring.

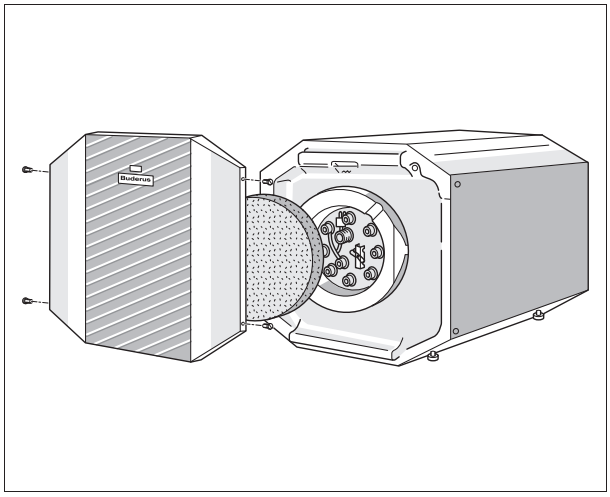

Fig. 5 Remove front cover

One carrying pipe stub (¾ NPT) for the front of the tank

- Screw a ¾“ coupling on a pipe end (Fig. 6, **Item. 1**).
- Tread coupling on front clean-out cover.

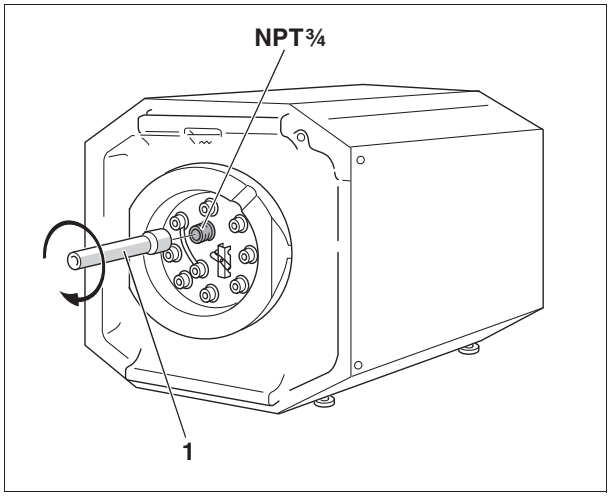

Fig. 6 Assembly of front carrying pipe stub

Two carrying pipe stubs (1“ NPT) on rear side of tank

- Screw two 1“ coupling on two pipe ends (Fig. 7, **Item. 1**).
- Screw carrying pipe stubs on boiler coil connections.

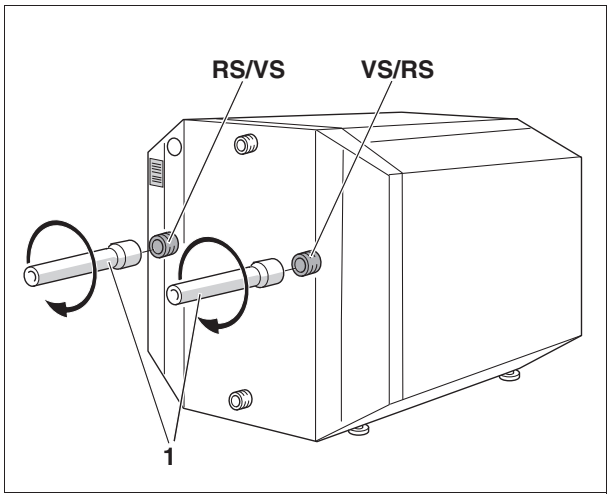

Fig. 7 Assembly of rear carrying pipe stubs

6 Tank Installation

6.1 Placement of the Tank

The tank is designed for horizontal installation and can serve as base for a Buderus boiler.

For placement of the tank, observe the recommended clearance dimensions for proper access and service. (Fig. 8). Buderus requires maintaining a minimum clearance of 2" between hot water piping and combustible surfaces.

Make sure that the floor is level and sufficiently strong. The tank can be installed on combustible flooring as long as the screw-in feet are used.

TANK DAMAGE

Due to frost.

CAUTION!

- Make sure that the boiler room is dry and frost free.

- Level the tank using the adjustable feet (Fig 9).

NOTICE

The screw-in feet have rubber feet that allows you to slide the tank in its final location.

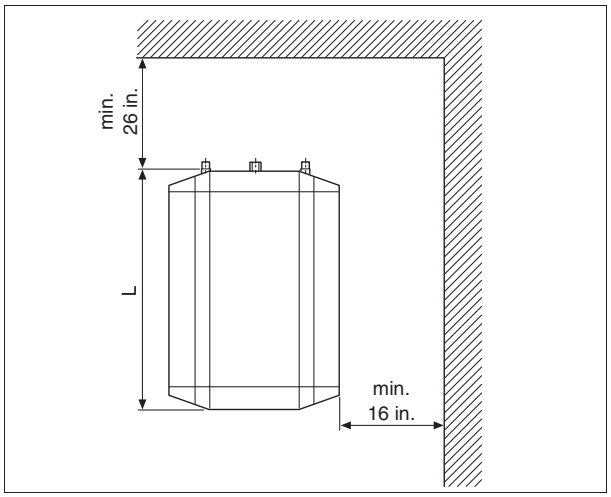

Fig. 8 Placement of tank (Recommended clearances)

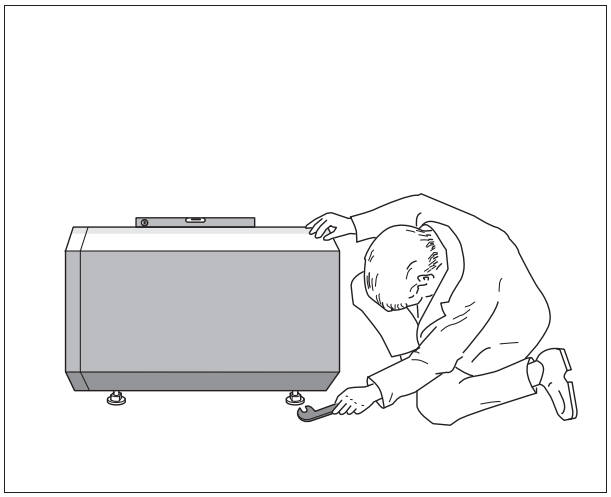

Fig. 9 Leveling of the tank using a level

6.2 Installation of Water Piping

Please observe the following warnings before piping the indirect tank. Follow these warnings carefully to ensure trouble free operation. The installation of the indirect-fired hot water tank and all associated piping must be in accordance with all applicable codes and regulations. All work must be done by a licensed contractor.

CAUTION!

TANK DAMAGE

In the domestic water connections AW, EZ and EK you will find protective inserts. These inserts provide additional protection to the coated interior pipe surfaces.

- Keep these inserts in place during piping.

WARNING!

HEALTH DANGER

The domestic water can be contaminated if the assembly process is done in a unclean fashion.

- Install all domestic water piping in a hygienic fashion and clean all joints thoroughly.

CAREFUL!

SYSTEM DAMAGE

Due to unprofessional installation.

- Observe all local codes and regulations as well as common industry standards during installation and operation of the tank.

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NOTICE

When a backflow preventer is present or required, a domestic expansion tank must be used.

CAREFUL!

SYSTEM DAMAGE

Due to leaking connections.

- Install all piping connections without tension.
- When using flexible connections, make sure they are not kinked or twisted.

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NOTICE

If boiler output exceeds 100,000 Btu/hr, change the P and T relief valve to match or exceed the boiler rating.

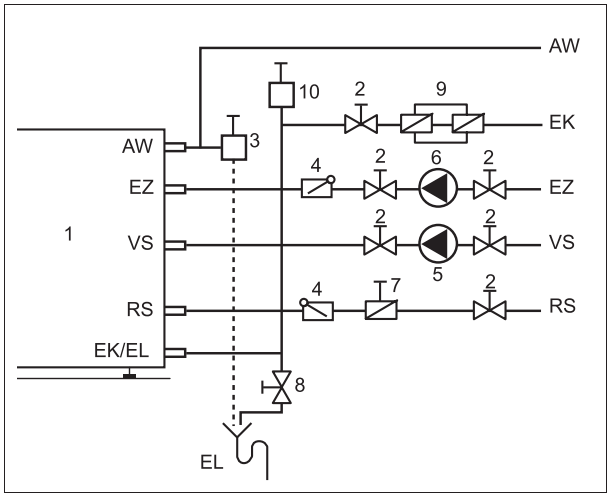

Fig. 10 Installation Diagram

Item. 1: *Indirect-fired hot water tank*

Item. 2: *Service valve*

Item. 3: *P and T relief valve*

Item. 4: *Flow check*

Item. 5: *Tank charging pump*

Item. 6: *Optional DHW recirc pump*

Item. 7: *Air purge valve*

Item. 8: *Drain valve*

Item. 9: *Back flow preventer*

Item. 10: *Thermal expansion tank*

AW: DHW outlet
EZ: DHW recirc tapping
VS Boiler supply
RS Boiler return
EK/EL: DHW inlet/drain

- Install furnished brass tees on AW and EK/EL connections. Install supplied P and T valve on ¾" connection of brass tee at the AW connection; install tank drain on ¾" connection of brass tee at the EK/EL connection.
- If using a Logamatic control or Goldline SP30D control, plug EZ connection, or use it for DHW recirc.
- If using a Honeywell aquastat for tank water sensing, use furnished ¾" coupling and long shank immersion well on EZ connection to mount Honeywell aquastat on.

- Install all domestic water piping according to local code and regulations.
- Do not install elbows in the tank drain piping to ensure easy flushing of the tank.

6.3 Installation of Temperature Sensor/Aquastat

6.3.1 Logamatic or Goldline SP30D control

When using a Buderus Logamatic control or Goldline SP30D control, the temperature sensor must be strapped to the front of the tank. Remove the front cover from the tank. (see Chapter 5.2, page 9).

Follow the Installation Manual for the control regarding the proper electrical connections:

- Guide the sensor wiring (Fig. 11, **Item. 1**) into the raceway from the rear of the tank (Fig. 11, **Item. 2**). Make sure to lengthen the wiring for the LT300/2 model by splicing in 14 gauge wire.
- Pull the sensor wiring out of the raceway on the front of the tank.
- Guide the sensor wiring through the knock-out in the tank insulation (Fig. 12, **Item. 4**) to the clean-out cover.
- Slide the sensor under the strap-on clip (Fig. 12, **Item. 3**) on the clean-out cover and tighten this clip.

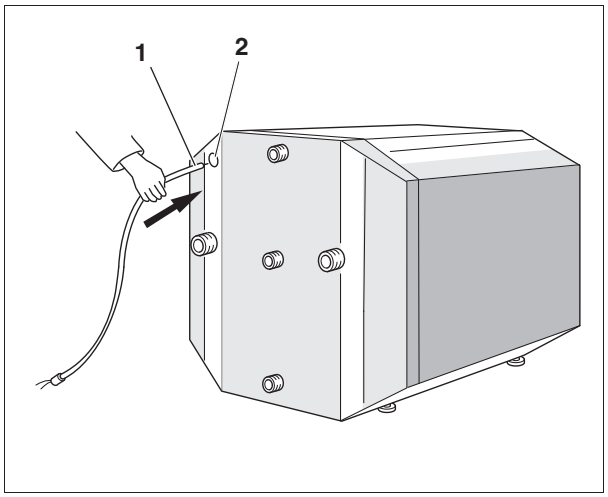

Fig. 11 Installation of temperature sensor

Item. 1: *Temperature sensor*

Item. 2: *Cable raceway*

6.3.2 Honeywell Aquastat

When using a Honeywell aquastat (not supplied), install as follows:

- Install ¾" brass coupling and long shank immersion well (furnished with tank) on the EZ connection.
- Slide Honeywell capillary fully into immersion well and secure aquastat to well.

6.4 Checking the Magnesium Anode Connection

- Make sure that the ground cable (Fig. 12, **Item. 2**) of the magnesium anode rod (Fig. 12, **Item. 1**) is securely tightened to one of the clean-out cover bolts.

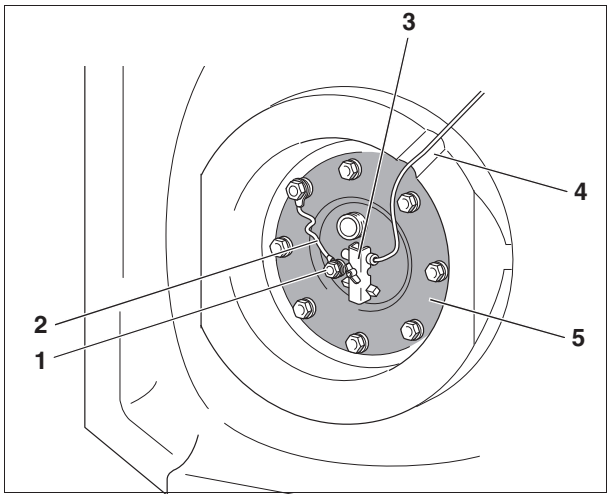

Fig. 12 Testing the Magnesium anode rod

Item. 1: *Magnesium anode*

Item. 2: *Ground cable*

Item. 3: *Sensor fastening clip*

Item. 4: *Knock-out in insulation*

Item. 5: *Clean-out cover*

7 Putting the Tank in/out of Operation

7.1 Putting the Tank in Operation

Prior to putting the tank in operation, check for leaks and correct immediately.

NOTICE

- Check for leaks on the tank using strictly domestic water. Maximum DHW test pressure can not exceed the pressure relief valve rating.

- Open the highest tap location, to vent the domestic water system.
- Open the cold feed to the tank (Fig. 13, **Item. 1**) to fill the tank.
- Prior to heating the tank, check to make sure that the boiler, tank and water lines are filled with water. Open a hot water faucet at the highest location for this purpose. Close faucet afterwards.
- Check all connections, water lines and clean-out cover for leaks.

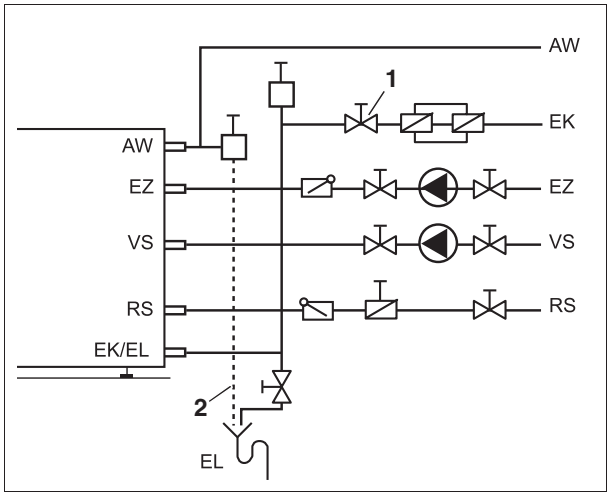

Fig. 13 Installation diagram

Item. 1: *Shut-off valve for cold feed*

Item. 2: *Pressure/temperature (P and T) relief piping*

AW: DHW outlet

EK: Cold feed

EZ: DHW recirc

7.1.1 Installation of Insulation and Front Cover

- Place insulation ring (Fig. 14, **Item. 2**) on clean-out cover.
- Install front cover (Fig. 14, **Item. 1**) and secure with 4 screws.

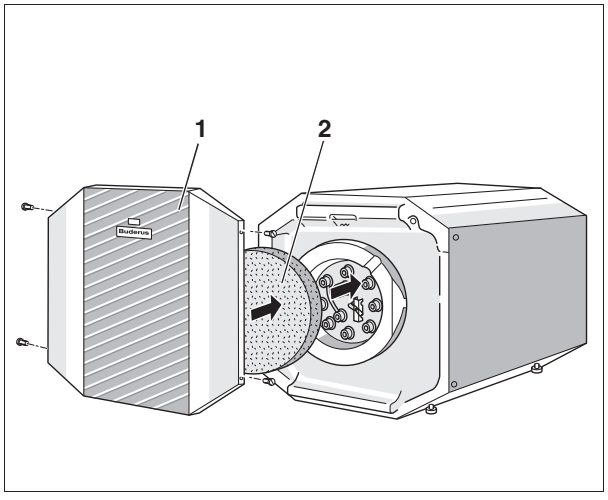

Fig. 14 Installation of insulation and front cover

Pos. 1: *Front cover*

Pos. 2: *Insulation ring*

7.2 Operating Notice

CAUTION!

TANK DAMAGE

When the pressure/temperature relief valve is blocked or damaged, potential damage may occur to the tank and a very dangerous situation can develop.

- Make sure that the P and T relief piping Fig. 13, page 13) is **NEVER** blocked.

Notify the end-user/owner of the following points:

– Make sure to always keep P and T relief piping open and unobstructed (Fig. 13, page 13).

– Periodically to check the operation of the P and T valve by manually opening the valve.

– To contact a qualified service company or contractor if the manual reset trips regularly on the boiler (if required by local code).

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NOTICE

Information regarding operation of the sensor/aquastat can be obtained from the documentation furnished with the control.

7.3 Taking out of Operation

CAUTION!

TANK DAMAGE

When the tank is kept empty for several days, localized corrosion can take place due to residual moisture.

- Dry out the tank interior using warm air and keep the access port open.

In case the tank is not used for a long time, we recommend the following:

- Keep the tank in operation.
- Set the control to the vacation function (Logamatic), or set the tank to its minimum setting.

When the tank has been taken out of operation, observe local code and regulations regarding placing the tank back in operation and possibly rinsing the domestic water lines.

8 Maintenance

It is recommended that a licensed contractor or service company checks and cleans the tank at least once every two years.

For unfavorable water conditions, (hard or very hard), extreme high usage and/or high temperature, more frequent inspections and cleanings are recommended.

CAUTION!

TANK DAMAGE

Due to improper maintenance and cleaning.

- Perform the inspection and cleaning at least every two years.
- Correct any problems immediately.

8.1 Preparing the Tank for Maintenance

- Disconnect electricity to the heating system.
- Remove front cover and insulation ring from the tank (see Chapter 5.2 „Moving the Tank Unpackaged“, page 9).
- Drain tank. Shut off the cold feed (EK) and open tank drain (Fig. 10, page 11). Open the highest faucet for venting.
- Remove hex head bolts (Fig. 15, **Item. 4**) from the clean-out cover (Fig. 15, **Item. 3**).
- Remove clean-out cover together with Magnesium anode (Fig. 15, **Item. 1**) and gasket (Fig. 15, **Item. 2**).

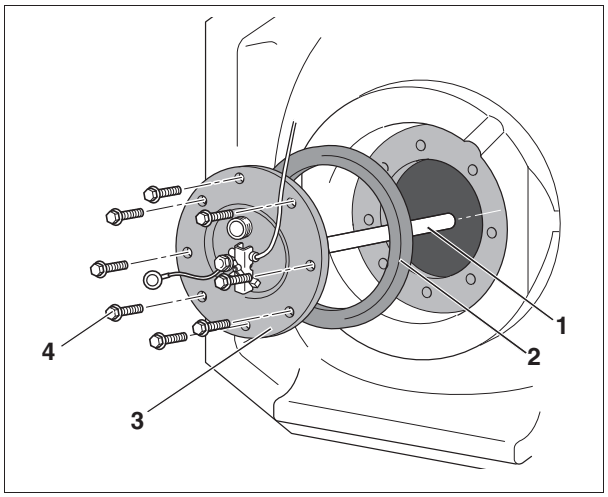

Fig. 15 Removal of clean-out cover

Item. 1: *Magnesium anode*

Item. 2: *Clean-out cover gasket*

Item. 3: *Clean-out cover*

Item. 4: *Hex head bolts*

8.2 Cleaning the Tank

- Check the tank interior for lime deposits.

SYSTEM DAMAGE

Due to damaged tank surface scratching.

CAUTION!

- Do NOT use sharp objects to clean the tank interior.

Follow the procedure below to properly clean the tank interior:

- Spray the interior surfaces with a high pressure cold water stream (ca. 58 – 72 psi) (Fig. 16).

  You can increase the effectiveness by circulating heated boiler water through the coil. The thermal shock will cause the deposits to break off the smooth surface heat exchanger. Use a wet vac to remove the deposits from the bottom of the tank.

When large quantities of lime and deposits are found in the tank, it is advisable to remove these using a chemical treatment. We recommend to have the chemical cleaning performed by a professional service company.

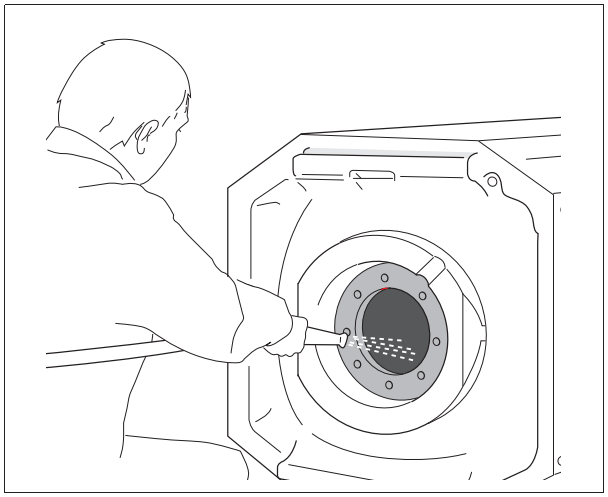

Fig. 16 Spraying of tank interior

8.3 Checking Anode Operation

The Magnesium anode rod is a sacrificial rod that will be consumed during use. You must verify the status and diameter of the anode rod at least once every two years.

In addition, we recommend to perform an annual check of the electrical protective current.

Benefits of the current measurement are:

– You do not need to shut down the heating system.

– You do not need to access or remove the anode rod.

8.3.1 Visual Inspection of Anode Rod

- Check magnesium anode (Fig. 18, **Item. 1**) for decay. Replace anode rod, if the diameter is reduced to ½" to ¾".

NOTICE

Do not contaminate the surface of the rod with oil or grease. Keep the rod clean.

8.3.2 Check the Magnesium anode with Multi-meter

Follow the outlined procedure:

- Remove one side of the grounding lead (Fig. 17, **Item. 3**) on the tank.
- Set multi-meter (MM) to DcmA (milli amps)
- Connect black cable (Fig. 17, **Item. 6**) of MM to grounging cable or bolt (Fig. 17, **Item. 7**).
- Connect red cable (Fig. 17, **Item. 5**) of MM to the anode.
- Ensure clean metallic surfaces for terminal connections.
- The tank must be filled with water during the test.
- A reading between .3 mA and 10 mA on the MM is good.
- Record readings each year in the Table 4.

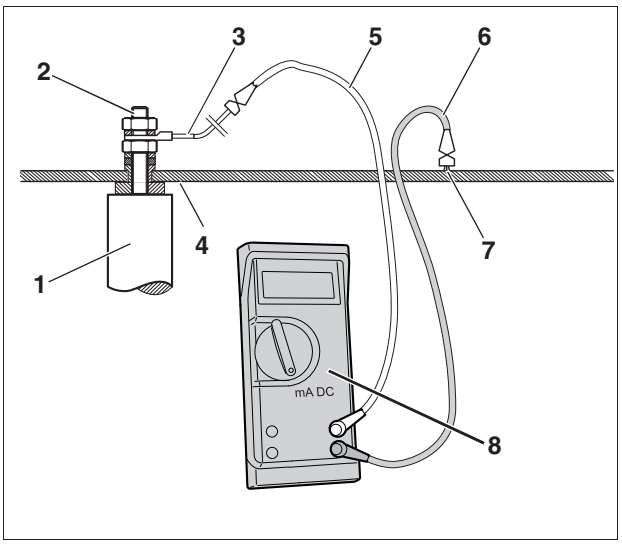

Fig. 17 Testing the anode with an multi-meter

Item. 1: *Magnesium anode*

Item. 2: *M8-bolt*

Item. 3: *Ground cable*

Item. 4: *Clean-out cover*

Item. 5: *Red cable from multi-meter*

Item. 6: *Black cable from multi-meter*

Item. 7: *Hex head bolt from tank*

Item. 8: *Digital multi-meter*

Record the test date and sign off in the table below:

Date	mA Reading	Service Company/Signature

Table 4 Service records

- Properly reconnect the grounding cable after each test.

8.4 Changing out the Anode

- Remove the M8 nut (Fig. 18, **Item. 10**) to remove the ground cable (Fig. 18, **Item. 8**).
- Remove M8 nut (Fig. 18, **Item. 7**).
- Separate clean-out cover (Fig. 18, **Item. 3**) from the Magnesium anode rod (Fig. 18, **Item. 1**).
- Replace Magnesium anode rod.
- Install new rod including the small parts, as shown in Fig. 18.

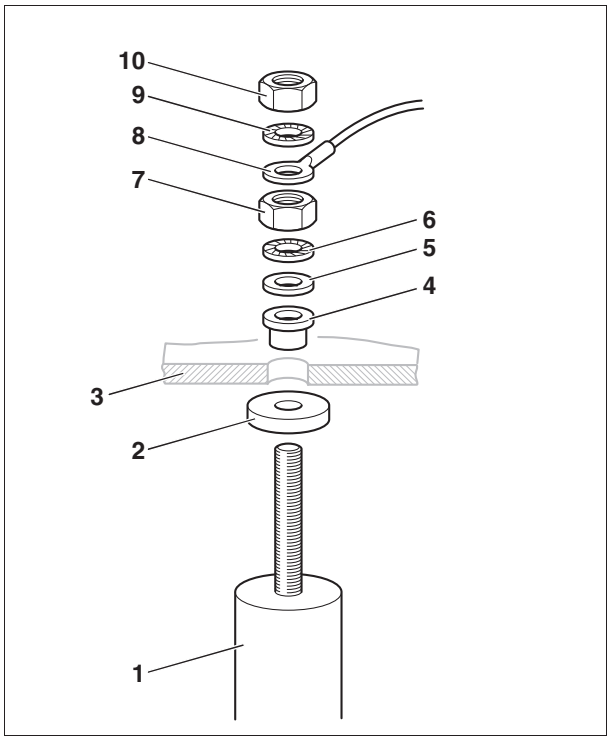

Fig. 18 Changing out of the Magnesium anode rod

Item. 1: *Magnesium anode*

Item. 2: *Gasket*

Item. 3: *Clean-out cover*

Item. 4: *Insulation piece*

Item. 5: *Flat washer*

Item. 6: *Lock washer*

Item. 7: *M8 nut*

Item. 8: *Ground cable tab*

Item. 9: *Lock washer*

Item. 10: *M8 nut*

8.5 Placing the Tank Back in Operation after Cleaning

- Install the clean-out cover together with magnesium anode (Fig. 19, **Item. 1**) back in the tank. Observe the orientation of the tank gasket. The word "Deckelseite" must be facing the clean-out cover.

SYSTEM DAMAGE

Due to defective gasket.

CAUTION!

- We recommend using a new gasket (Fig. 19, **Item. 2**) when changing out the Magnesium anode to avoid a leakage at the tank.

- Tighten hex head bolts (Fig. 19, **Item. 4**) by hand.

SYSTEM DAMAGE

Due to corrosion.

CAUTION!

- Make sure to securely tighten the ground cable (Fig. 19, Item 5) with a wrench to the clean-out cover to ensure a good electrical connection.

- Tighten the hex head bolts for the clean-out cover with a ¾ turn using a wrench (Fig. 19, **Item. 4**).
- Fill the tank and turn on the heating system.
- Check all connections and clean-out cover for leaks.
- Put back the insulation ring (Fig. 20, **Item. 2**).
- Put the front cover (Fig. 20, **Item. 1**) back and secure with 4 screws.

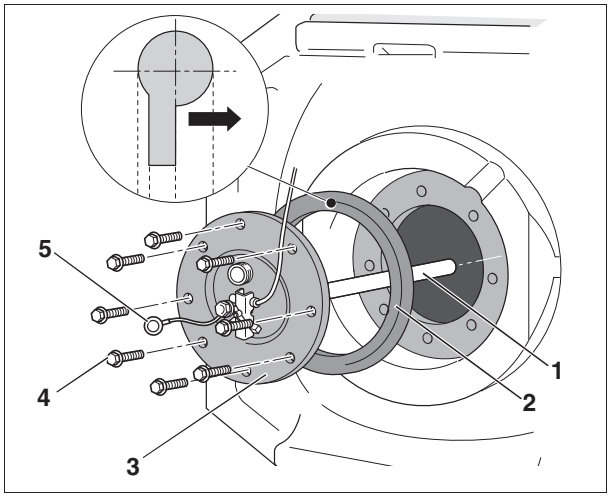

Fig. 19 Installing a new anode rod

Item. 1: *Magnesium anode*

Item. 2: *Clean-out cover gasket*

Item. 3: *Clean-out cover*

Item. 4: *Hex head bolt*

Item. 5: *Ground cable tap*

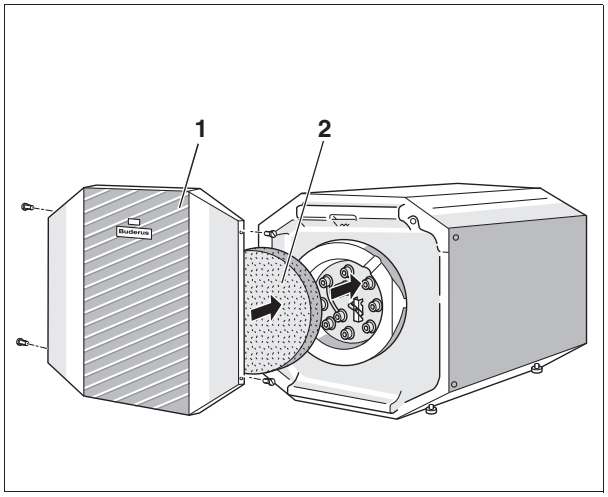

Fig. 20 Installing insulation and front cover

Item. 1: *Front cover*

Item. 2: *Insulation Ring*

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